

**UNITED STATES DEPARTMENT OF COMMERCE****Patent and Trademark Offic**Address: COMMISSIONER OF PATENTS AND TRADEMARKS
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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. |
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09/132,157 08/11/98 FORBES

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SCHWEGMAN LUNDBERG WOESSNER & KLUTH
P O BOX 2938
MINNEAPOLIS MN 55402

EXAMINER

PRENTY, M

ART UNIT PAPER NUMBER

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DATE MAILED:

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Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

| | | |
|------------------------------|--------------------------------------|-------------------------------|
| Office Action Summary | Application No. 09/132,157 | Applicant(s) Forbes |
| | Examiner Prenty | Group Art Unit 2822 |

Responsive to communication(s) filed on Jun 30, 2000.

This action is **FINAL**.

Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire three month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claims

Claim(s) 11, 13, 14, 24-28, 30-32, and 38-43 is/are pending in the application.

Of the above, claim(s) _____ is/are withdrawn from consideration.

Claim(s) _____ is/are allowed.

Claim(s) 11, 13, 14, 24-28, 30-32, and 38-43 is/are rejected.

Claim(s) _____ is/are objected to.

Claims _____ are subject to restriction or election requirement.

Application Papers

See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

The drawing(s) filed on _____ is/are objected to by the Examiner.

The proposed drawing correction, filed on _____ is approved disapproved.

The specification is objected to by the Examiner.

The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

All Some* None of the CERTIFIED copies of the priority documents have been

received.

received in Application No. (Series Code/Serial Number) _____.

received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____.

Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

Notice of References Cited, PTO-892

Information Disclosure Statement(s), PTO-1449, Paper No(s). _____

Interview Summary, PTO-413

Notice of Draftsperson's Patent Drawing Review, PTO-948

Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

This Office Action is in response to the papers filed June 30, 2000.

Claims 11, 24, 25, 30 and 32 are rejected under 35 U.S.C. §102(b) as anticipated by or, in the alternative, under 35 U.S.C. §103(a) as obvious over Aronowitz et al. (United States Patent 5,296,386 already of record). See Aronowitz et al's Fig. 1 disclosure in particular. Note that device claims 11, 24, and 25's "wherein the $\text{Si}_{1-x}\text{Ge}_x$ channel region is formed subsequent to formation of the gate oxide" and device claims 30 and 32's "wherein the silicon-germanium alloy is formed subsequent to formation of the gate oxide" process limitations are not determinative of patentability. See *In re Thorpe*, 777 F.2d 695, 227 USPQ 964 (Fed. Cir. 1985).

Claims 13, 26, 27 and 31 are rejected under 35 U.S.C. §103(a) as being unpatentable over Aronowitz et al. (United States Patent 5,296,386 already of record) together with Crabbe' et al. (United States Patent 5,821,577 already of record). Specifically, the difference between Aronowitz et al. and the transistor recited in the set of rejected claims is that the latter's SiGe channel thickness is unknown while the former's SiGe channel thickness is "approximately 100 to 1,000 angstroms" (claims 13, 26 and 31) or "approximately 300 angstroms" (claim 27). Crabbe' et al. discloses forming SiGe channels 100 to 500 angstroms thick (see column 6, lines 17-22). It would have been obvious to one skilled in this art to make Aronowitz et al's transistor channel 100 to 500 angstroms thick as suggested by Crabbe' et al. Claims 13, 26, 27 and 31 are thus rejected under 35 U.S.C. §103(a) as being unpatentable over Aronowitz et al. together with Crabbe' et al.

Claims 11, 14, 24, 25, 28, 30, 32, 38, 40 and 41 are rejected under 35 U.S.C. §103(a) as being unpatentable over Selvakumar et al. (United States Patent

5,426,069 already of record) together with Aronowitz et al. (United States Patent 5,296,386 already of record). Specifically, the difference between Selvakumar et al's metal-oxide-semiconductor (i.e., MOS) transistor (see Selvakumar et al's Figures 1-7 disclosure in particular) and the claimed MOS transistor is they are N-type and P-type, respectively¹. Aronowitz et al. teaches silicon-germanium (i.e., SiGe) channel regions in both N-type and P-type MOS transistors (see Aronowitz et al's Abstract, for example). It would have been obvious to one skilled in this art to extend Selvakumar et al's N-type MOS transistor with SiGe channel disclosure to a P-type MOS transistor as suggested by Aronowitz et al. Claims 11, 14, 24, 25, 28, 30, 32, 38, 40 and 41 are thus rejected under 35 U.S.C. §103(a) as being unpatentable over Selvakumar et al. together with Aronowitz et al.

Claims 13, 26, 27, 31, 39, 42 and 43 are rejected under 35 U.S.C. §103(a) as being unpatentable over Selvakumar et al. (United States Patent 5,426,069 already of record) together with Aronowitz et al. (United States Patent 5,296,386 already of record) and Crabbe' et al. (United States Patent 5,821,577 already of record). Specifically, the difference between the obvious Selvakumar et al. / Aronowitz et al. transistor and the transistor recited in the set of rejected claims is that the latter's SiGe channel thickness is unknown while the former's SiGe channel thickness is "approximately 100 to 1,000 angstroms" (claims 13, 26, 31, 39 and 42) or "approximately 300 angstroms" (claims 27 and 43). Crabbe' et al. discloses forming SiGe channels 100 to 500 angstroms thick (see column 6, lines 17-22). It would have been further obvious to one skilled in this art to make the obvious Selvakumar et al. /

¹ although it could be argued that the claimed MOS transistor is not necessarily P-type because a claim's preamble is generally not given patentable weight. See *In re Hirao*, 535 F.2d 67, 190 USPQ 15 (CCPA 1976).

Aronowitz et al. transistor's channel 100 to 500 angstroms thick as suggested by Crabbe' et al. Claims 13, 26, 27, 31, 39, 42 and 43 are thus rejected under 35 U.S.C. §103(a) as being unpatentable over Selvakumar et al. together with Aronowitz et al. and Crabbe' et al.

The applicant's arguments, including the declaration filed under 37 C.F.R. §1.132, are largely moot in view of the new grounds of rejection (indeed, it is unclear as to which of the prior rejections the declaration was directed).

To the extent the declaration relates to the new rejections, it is not persuasive. First, the declaration is by the inventor and thus self-serving. Furthermore, the declarant's reliance on the Scientific American article appears misplaced because said article does not address Selvakumar et al's and Aronowitz et al's methods. Finally, United States Patents such as those to Selvakumar et al. and Aronowitz et al. are presumed valid (and thus enabled).

Registered practitioners can telephone examiner Prenty at (703) 308-4939.
All other parties should telephone (703) 308-0956.

Mark Prenty
Mark V. Prenty
Primary Examiner